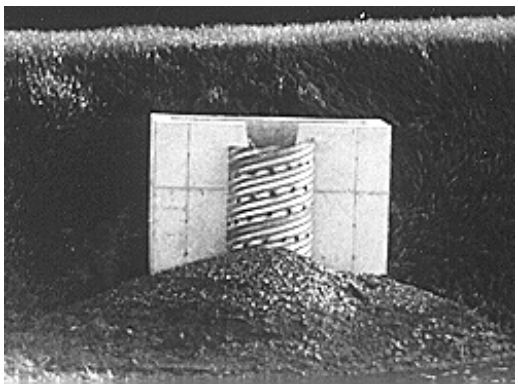
4.8 Retrofitting

Rt

Definition

A device or structure placed in front of a permanent stormwater detention pond outlet structure to serve as a temporary sediment filter.



Purpose

Retrofit structures allow permanent stormwater detention basins to function as temporary sediment retention basins.

Conditions

This standard applies under the following conditions:

1. Retrofitting cannot be used in detention ponds on live streams or in basins with a total contributing drainage area of 50 acres or more.

2. Can only be used in detention basins large enough to store 67 cubic yards of sediment per acre of disturbed area in the project. Required sediment storage may be obtained by excavating in front of the retrofitted outlet structure.

3. Shall be considered a temporary structure and will be removed as soon as the project is completed. All accumulated sediment will be removed from the detention pond basin.

Design Criteria

1. The height of the retrofit should be approximately one-half of the height of the stormwater management outlet structure.

2. The required sediment storage volume shall be achieved by either excavating the basin or raising the outlet structure to achieve 67 cubic yards of sediment storage.

   This storage volume is exclusive of stormwater storage requirements. It is recommended that the sediment storage volume be based on total drainage area when possible. Remove sediment when the basin is one-third full.

3. For effective trapping efficiency, the sediment delivery inlets should be located at the upper end of the basin.

4. For effective trapping efficiency, the length-width ratio of the basin shall be at least 2:1. Flow length may be increased by installing baffle walls within the basin.

5. Drawings and computations prepared by a registered professional engineer shall be submitted for approval by the local governing agency.

Construction Specifications

The following types of structures are acceptable under the designated conditions:

1. Perforated Half-Round Pipe with Stone Filter (See Figure 4.8.1)

    a. Diameter of half-round pipe should be 1.5 times the diameter of the principal pipe outlet or wider than the greatest width of the concrete weir.

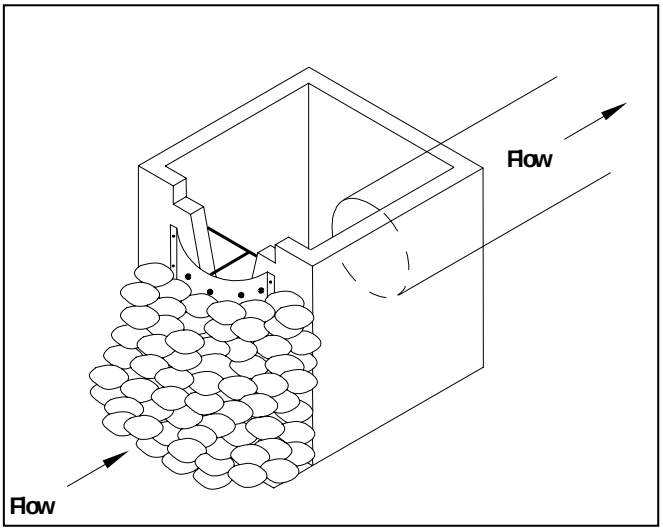


Figure 4.8.1 Perforated Half-Round Pipe Retrofit with Stone Filter. See Figure 4.8.2 for exploded view of this structure.

    b. Perforations and stone sizes are shown in Figure 4.8.2.

    c. Shall be fixed by specified means (bolts, etc.) to concrete outlet structure but never used on exposed pipe end or winged headwall.

    d. Should be used only in detention ponds with less than 30 acres total drainage area.

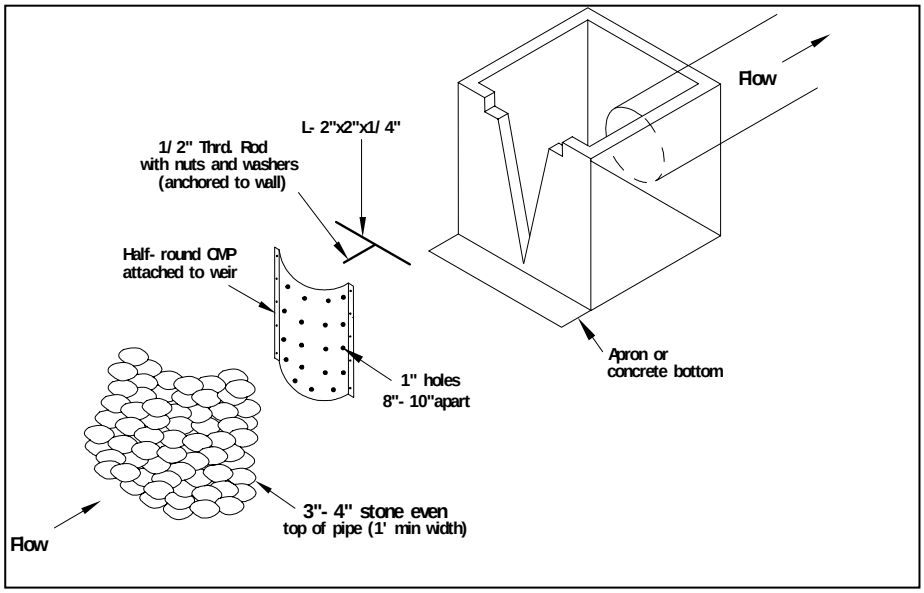


Figure 4.8.2 Perforated Half-Round Pipe Retrofit with Stone Filter Installation Requirements

2. Slotted Board Dam With Stone (See Figure 4.8.3)

   a. Can be used with open end pipe outlets, winged headwalls, or concrete weir outlets.

   b. Should be installed with minimum size 4-foot by 4-foot posts.

   c. Boards shall have 0.5- to 1-inch space between them.

   d. Minimum size 3- to 5-inch stone filter shall be installed around the upstream side of the board dam.

   e. Can be used in detention ponds with drainage areas up to 50 acres.

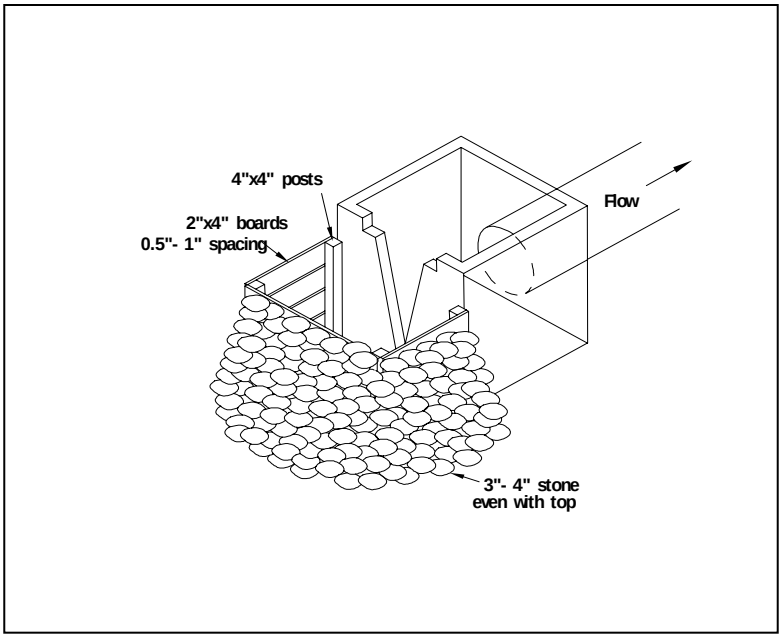


Figure 4.8.3 Slotted Board Dam Installation Requirements

3. Stone Filter Rings

    a. Can be used in conjunction with half-rounds or board dams, as additional sediment filtering device.

    b. For pipe diameters larger than 12 inches, stone size should be a minimum 10- to 15-inch stone, faced with smaller filter stone on the upstream side, if necessary.

4. All disturbed areas shall be vegetated immediately after construction with perennial vegetation.

Maintenance

All types of retrofit structures must be kept clear of trash and debris. This will require continuous monitoring and maintenance, which includes sediment removal when one-third full. Structures are temporary and should be removed when the land-disturbing project has been restabilized.